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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,746	10/26/2001	Mamiko Miyanaga	SOEI/0013	9682
32588	7590	09/29/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			MCALEAVEY, ANDREW JAMES	
			ART UNIT	PAPER NUMBER

1746

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/045,746		MIYANAGA ET AL.	
	Examiner		Art Unit	
	Andrew McAleavey		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 7-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 1-6 in the reply filed on September 10, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

2. The disclosure is objected to because of the following informalities:

On page 5, in paragraph [0014], the word "8888metallic" is used. This is believed to be a typographical error.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites that "the supply of a cooling medium to [the] chamber for cooling [the] shower head is restricted." There is insufficient antecedent basis for this limitation,

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the limitation is not a positive method step, and it is unclear how restricting the flow of coolant to the shower head relates to the other recited steps.

If Applicants intend to recite restricting the flow of cooling medium to the showerhead, the Examiner suggests that such a step either be coupled to a step of supplying cooling medium (e.g., "supplying cooling medium to a shower head at a defined flow rate [...]; and restricting the flow rate of the cooling medium to said shower head") or coupled to the recited step of raising the temperature (e.g. "raising the temperature of said shower head...by restricting the flow of cooling medium to said shower head").

Claims 3 and 4 are rejected because both claims recite applying heat, whereas claim 1 recites increasing the temperature of the shower head. These claims do not recite positive method steps, and it is unclear whether there is any connection between the recited step of increasing the temperature of the shower head and the step of applying heat. Does the step of raising the temperature of the shower head comprise applying heat?

Claim 3 is also rejected because it depends from claim 2.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al., U.S. Patent No. 6,170,492 (hereinafter "Ueda"), in view of Kinnard et al., U.S. Patent No. 6,635,117 (hereinafter "Kinnard").

Ueda discloses a process for cleaning a vapor phase deposition (CVD) chamber in column 4, lines 30-65. Specifically, Ueda discloses activating a cleaning gas including a compound containing fluorine atoms (nitrogen trifluoride) by exposure to microwaves and introducing the resulting radicals into the process chamber (in Ueda, the gas is in plasma form). The cleaning process disclosed in column 4 is a tungsten cleaning process, indicating that the film-forming gas was a tungsten gas. A shower head arrangement (55; Figure 1) is disclosed.

With respect to claims 3 and 4, Ueda discloses a thermal heater (80; Figure 1) within its substrate support. Because of the proximity between the substrate support and the shower head, the Examiner's position is that "heat is applied to the shower head by a heater," as recited in the claims. The Examiner notes that the claims do not recite that heat is applied at a particular time in the process, or in conjunction with any particular method step.

Ueda does not explicitly disclose the particular temperatures of the shower head during the cleaning process. However, Kinnard discloses a shower head (baffle plate 100; Figure 1). Furthermore, Kinnard indicates at column 6, lines 45-67 that the shower head may be operated at "lower temperatures" of 15-80 degrees Celsius, but that "the lower baffle plate can be operated at up to 250° C to remove process residues from the surface of the plate." It would have been obvious to use the temperatures disclosed by Kinnard in the process of Ueda in order to increase the efficacy of cleaning for the shower head, as suggested by Kinnard.

With respect to claim 2, Kinnard discloses that the baffle includes a number of cooling passages, and that coolant flowing through the passages reduces the temperature of the baffle plate. See, for example, column 5, lines 1-2. Given that the cooling fluid in the passages cools the shower head, it would have been obvious to heat the shower head by restricting the flow of coolant. The Examiner notes that Kinnard also suggests controlling increased temperature by changing the type of cooling fluid at column 6, line 55; it is the Examiner's position that one of ordinary skill would have found it obvious to restrict coolant flow, rather than to change the fluid, in order to avoid the difficulty of changing the fluid.

The Examiner notes that although Ueda discloses the use of microwave-generated plasma, nothing in the claims explicitly requires that the activation step produce a plasma.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Steger et al., U.S. Patent No. 5,788,799, discloses microwave-activated cleaning processes at elevated temperatures in column 9.

Vanell et al., U.S. Patent No. 5,908,508, discloses maintenance of a showerhead at various temperatures.

Kitsunai et al., U.S. Patent No. 6,186,153 discloses various mixtures of fluorine-containing process and cleaning gases.

Demos et al., U.S. Patent Application Publication No. 2001/0008138 discloses plasma cleaning methods for CVD chambers.

Fukuda, U.S. Patent Application Publication No. 2003/0097987 is **not** prior art and is not being cited as such. However, the reference does appear to disclose Applicants' claimed invention. See, for example, paragraph [0111] and claim 9.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew McAleavey whose telephone number is 571-272-0542. The examiner can normally be reached on Monday through Friday, 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AM
9/27/04

MICHAEL BARR
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Michael Barr", with a long horizontal flourish extending to the right.